Bay Area Water Resources Planning

DWR Regional Forum June 27, 2011

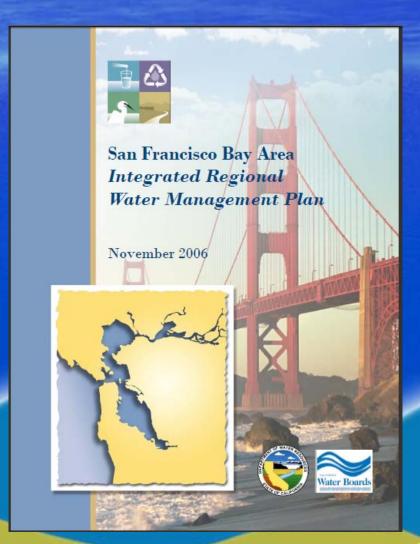
Paul Helliker
General Manager
Marin Municipal Water District



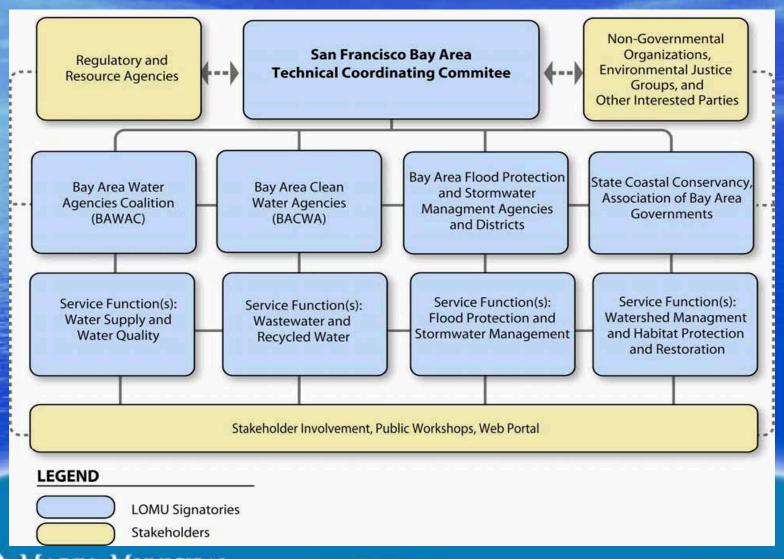
Bay Area Integrated Regional Water Management Plan

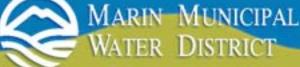
- > Adopted in 2006
- Developed by organizations consisting of or representing:
 - > 9 Counties
 - > 99 Cities
 - 5 Wholesale and 40 Retail Water Supply Utilities
 - > 57 Wastewater Utilities
 - > 1 Flood Control District
 - 2 Watershed Associations, composed of 50 agencies and NGOs
 - State Coastal Conservancy





Bay Area Regional Water Management Planning



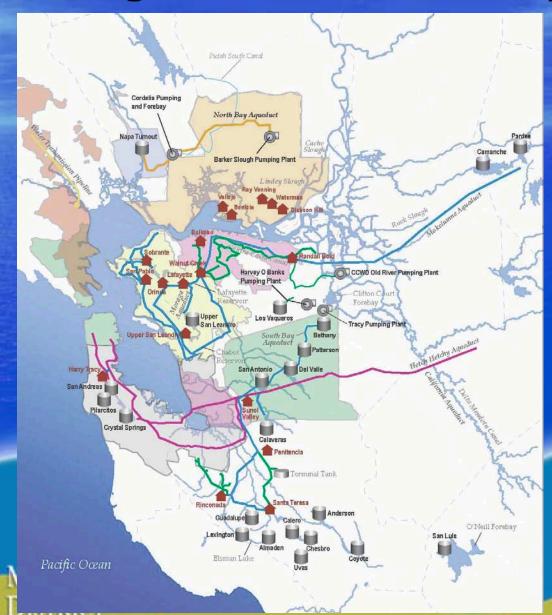


Bay Area Integrated Regional Water Management Proposals

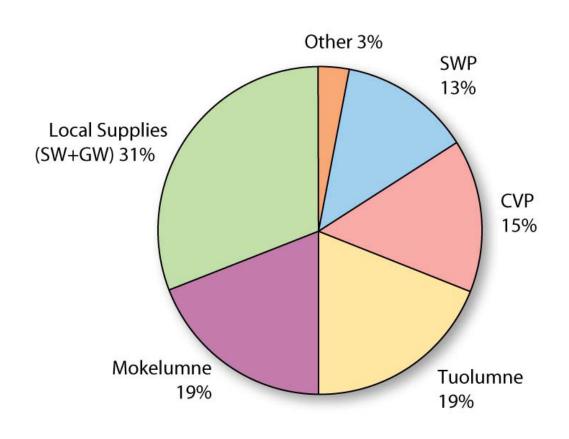
- > 127 Projects in the Original Plan
- Proposition 50 Proposals Composed of Water Conservation, Water Recycling (Round 1) and Flood Control and Ecosystem Restoration Projects (Round 2)
- > Proposition 84 Grant for Plan Update
- Proposition 84 Implementation Grant Conservation, Recycling, Green Infrastructure, Wetlands Restoration, Floodplain Management
- > Proposition 1E Flood Control Projects



Water Storage and Transmission Systems

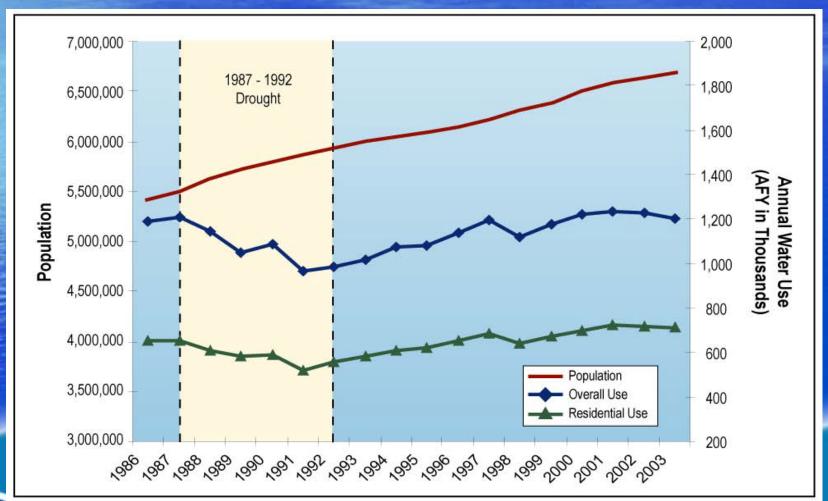


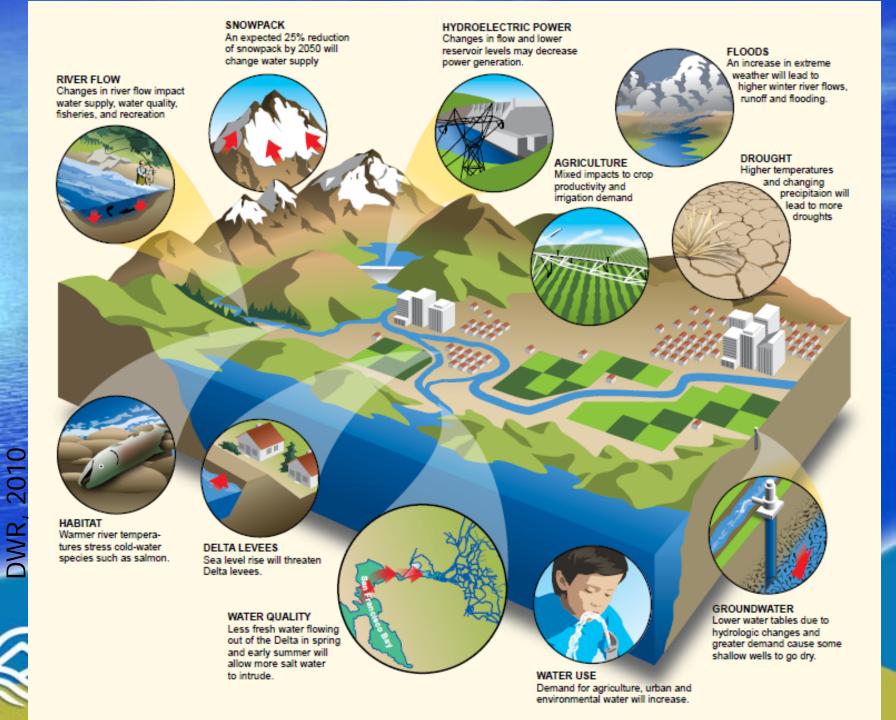
Bay Area Sources of Water Supply





Changes in Bay Area Population and Water Use



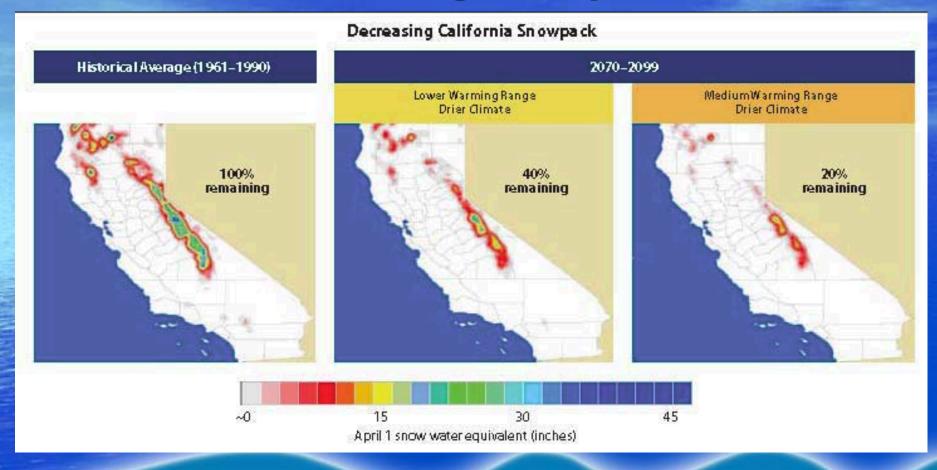


Threats to Water Supply Reliability

- Global Warming Reduced Snowpack
- ➤ Global Warming Increased Variability in Precipitation
- > Salinity Intrusion in Delta
- > Increasing Population and Demand
- Continued Declines in Aquatic Species Reduced Availability of Water Diversions
- > Vulnerability of Delta Levees to Failure
- ➤ Vulnerability of Dams and Transmission Systems to Earthquakes



Decreasing Snowpack



4.5 – 6 MAF reduction projected by 2050 – earlier runoff means more flood storage needed in the spring



Increasing Variability in Precipitation

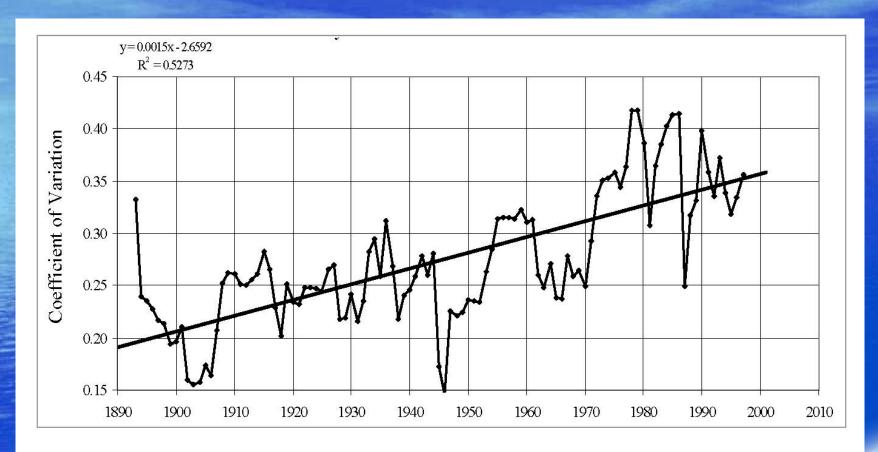


Figure 2-12 Coefficient of Variation for Annual Average Precipitation in California from 1890 to 2001 with Trend Line



Sacramento Valley Early Summer Runoff

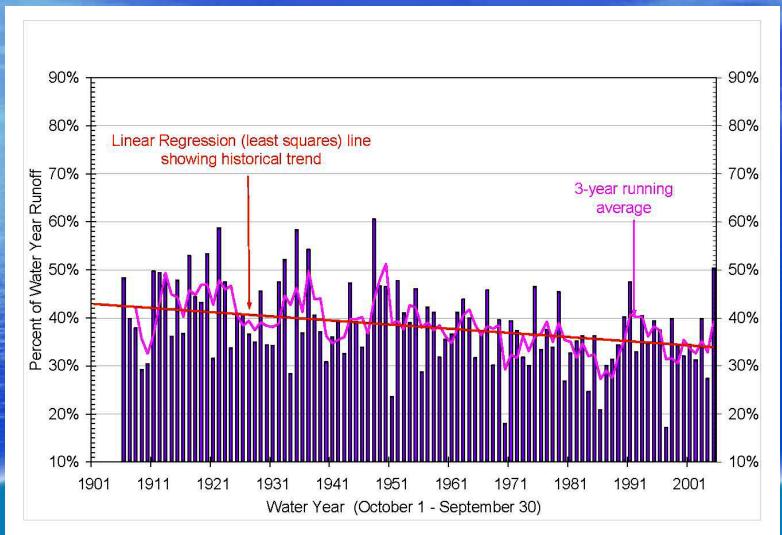


Figure 2-13 Annual April through July Unimpaired Runoff for Four Sacramento Valley Rivers Compared to Total Unimpaired Annual Runoff*



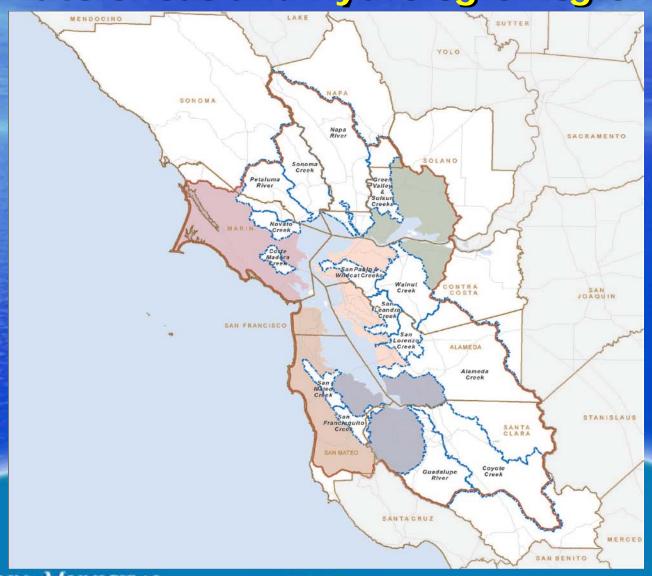
Strategies for Water Resources

Potential Strategy Benefits ¹									
Provide Water Supply Benefit MAF/year - Applied Water	Improve Drought Preparedness	Quality Operational Flex		Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft	Accumulated Cost by 2030 (\$ Billions)	

Potential Strategy Benefits ¹ MAF/year ²									Accumulated Cost by 2030 \$ Billions ²	
Agricultural Water Use Efficiency	611 0.1 - 1	1.0³ 🗯		=		•			25	0.3 - 5.0
Urban Water Use Efficiency	1.2-	3.1 💥		#		•	(=			2.5 - 6.0
Conjunctive Management & Groundwater Storage	6 0.5 - 2	2.0 💥		=	:	4000				N/A
Desalination – Brackish & Seawater	6 0.3 - 0	0.4 💥		=		dist				2.0 - 3.0
Precipitation Enhancement	6 0.3 - 0	0.4					(=			0.1 - 0.2
Recycled Municipal Water	1.8 - 2	2.3 💥		#		401	(=			6.0 - 9.0
Surface Storage—CALFED	M 0.1 -	1.1 🜞		=	.	4000	(=	160		0.7 - 9.2
Surface Storage—Regional/Local	₩ N/A	#		\Rightarrow	.	•	(=	160 -		N/A



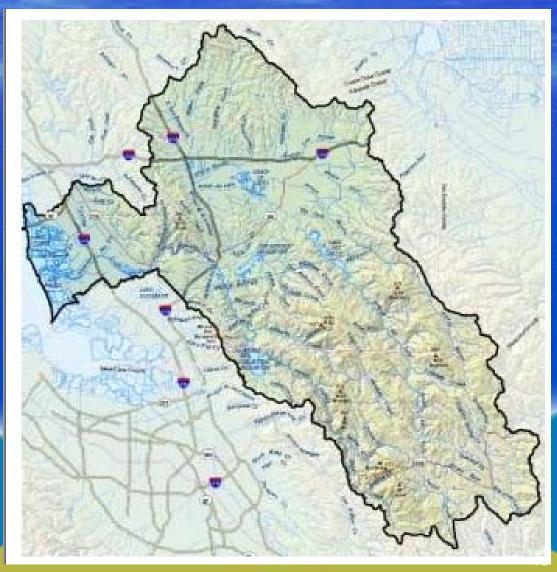
Watersheds and Hydrologic Region





Alameda Creek - Fisheries Restoration

- Largest watershed in the Bay Area 633sq. mi.
- Steelhead, coho, lampreys until the 1960's
- Channelization, urbanization, barriers caused extirpation

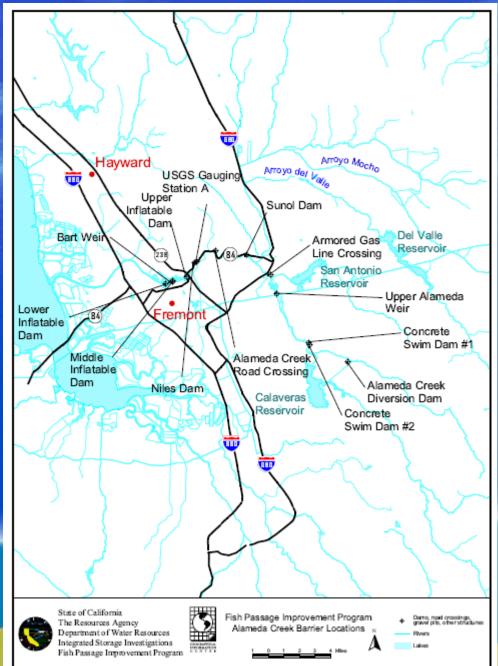




Project Partners

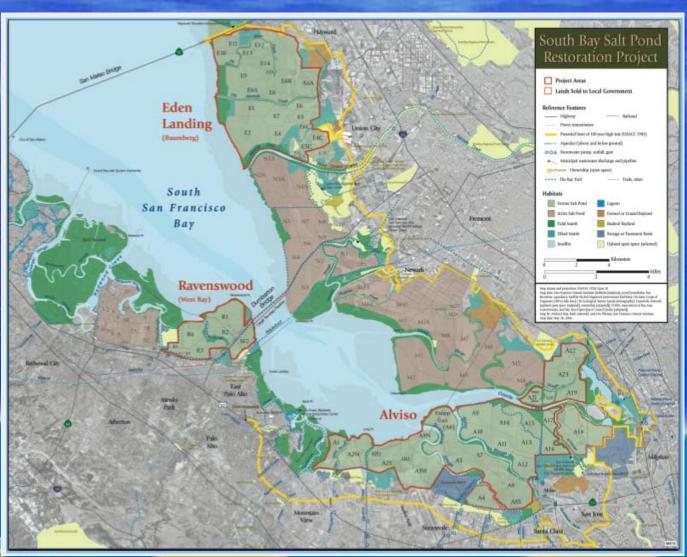
- California State Coastal Conservancy, California Department of Fish and Game
- National Marine Fisheries
 Services
- Alameda County Flood Control and Water Conservation District, Alameda County Resource Conservation District, Alameda County Water District, San Francisco PUC, Zone 7 Water Agency, East Bay Regional Park District
- Alameda Creek Alliance, PG&E





South Bay Salt Pond Restoration

- > 15,000 acres purchased in 2003
- > 1800 of 7500 acres of habitat restored
- 240 of1600 acresof pondsrestored



South Bay Salt Pond Restoration

Project Partners

- California State Coastal Conservancy and California Department of Fish and Game
- U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, NOAA, U.S. Geological Survey
- Santa Clara Valley Water District and Alameda County Flood Control and Water Conservation District
- Resources Legacy Fund, William and Flora Hewlett Foundation, the David and Lucile Packard Foundation, the Gordon and Betty Moore Foundation, and the Goldman Fund



San Francisco Bay

Approximately 54
Square Miles Today

Two Major Fresh Water Rivers to the East:

Sacramento and San Joaquin

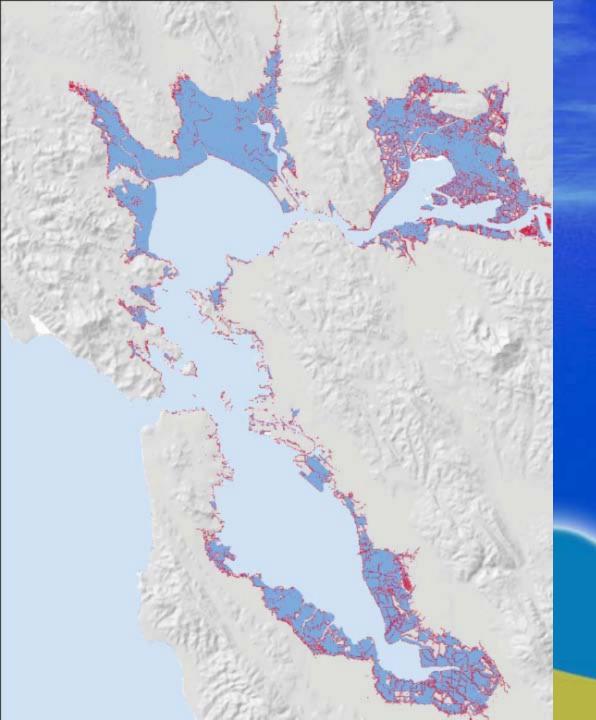
Drain 40% of the state











The New World: Sea Level Rise

Area subject to high tide with 16 inches of sea level rise

Current 100-year flood plain

Living with a Rising Bay:

A Regional Sea Level Rise Assessment



Photo: Noelle Murata



Photo: Jessica Merz



Photo: Mark Taylor, EBRPD



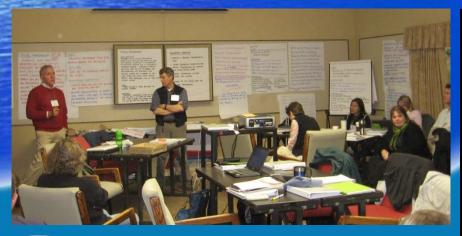
The map illustrates shoreline areas of San Francisco Bay that could be inundated by a 16-inch (blue) and 55-inch (purple) sea level rise.

ART Next Steps

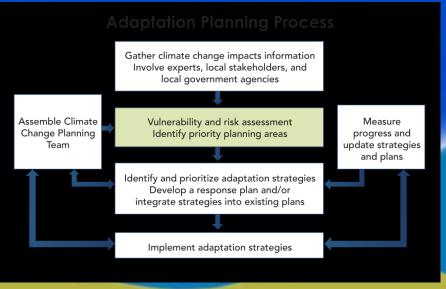




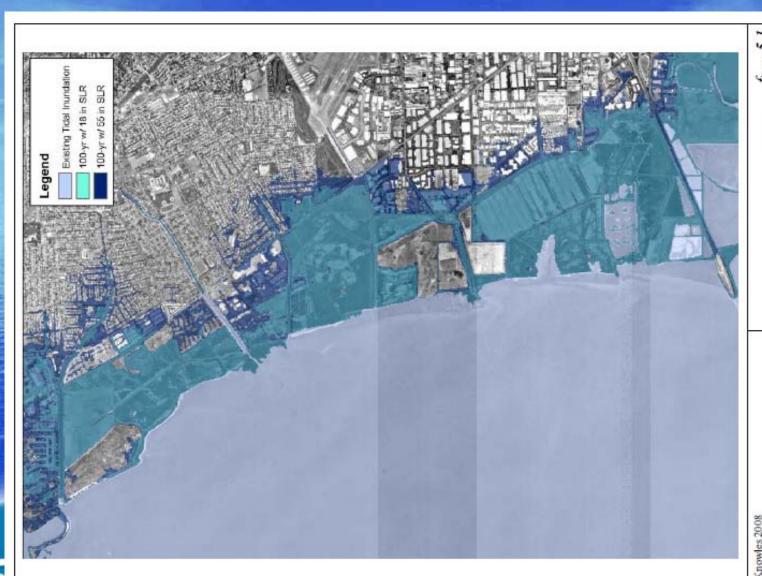




MARIN MUNICIPAL



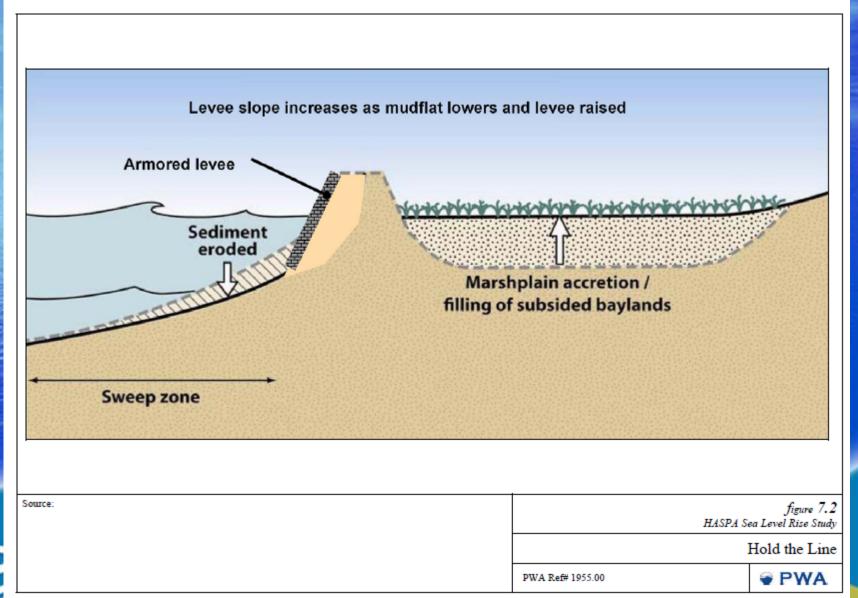
Hayward Shoreline Assessment



100-Year Water Level Inundation Map

PWA Ref# 1955.00

Holding the Line

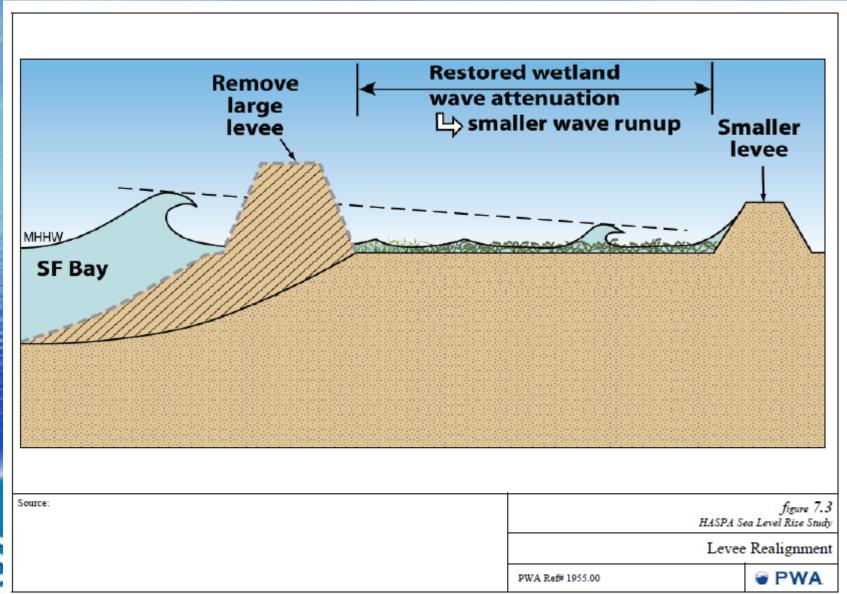


Example "Hold the Line" Concept at Existing Bay Levees

HASPA Sea Level Rise Stu

Cost: \$304-405 Million

Levee Realignment







O wood in-

VA Ref# 1955.00

Cost: \$216-289 Million

Gradual Steepening

